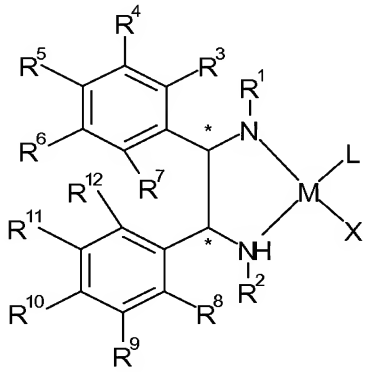
AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior listings and versions thereof.

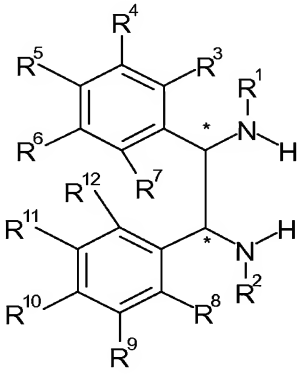
1. (Cancelled).

2. (Currently amended) An optically active transition metal-diamine complex represented by the formula (2):



wherein R^1 and R^2 each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, or $-SO_2R^{13}$ (wherein R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group), R^3 to R^{12} each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted aralkyloxy group, or a substituted amino group, M represents ~~a transition metal selected from the group consisting of~~ ruthenium~~, rhodium and iridium~~, X represents a halogen atom, L represents a ~~ligand~~ benzene which may be substituted with an alkyl group, and * represents an asymmetric carbon atom, provided that at least one of R^3 to R^7 and R^8 to R^{12} is a substituted amino group.

3. (Currently amended) An optically active transition metal-diamine complex obtained by reacting an optically active diamine compound represented by the formula (1):



(1)

wherein R^1 and R^2 each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, or $-SO_2R^{13}$ (wherein R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group), R^3 to R^{12} each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted aralkyloxy group, or a substituted amino group, and * represents an asymmetric carbon atom, provided that at least one of R^3 to R^7 and R^8 to R^{12} is a substituted amino group;
and a transition metal compound represented by the formula (3):

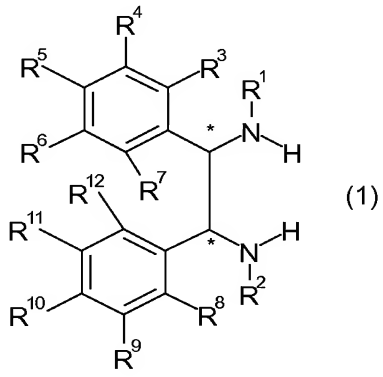
$$[MX_mL_n]_p \qquad (3)$$

wherein M represents ~~a transition metal selected from the group consisting of~~ ruthenium~~,~~ ~~rhodium and iridium~~, X represents a halogen atom, L represents a ~~ligand~~ benzene which may be substituted with an alkyl group, m represents 2 ~~or 3~~, n represents ~~0 or~~ 1, and p represents ~~1 or~~ 2.

4. (original) A catalyst for asymmetric synthesis comprising the optically active transition metal-diamine complex according to claim 2 or 3.

5. (original) The catalyst for asymmetric synthesis according to claim 4, wherein the catalyst for asymmetric synthesis is a catalyst for asymmetric reduction.

6. (Currently amended) A catalyst for asymmetric synthesis comprising an optically active diamine compound represented by the formula (1):



(1)

wherein R^1 and R^2 each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, or $-SO_2R^{13}$ (wherein R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group), R^3 to R^{12} each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted aralkyloxy group, or a substituted amino group, and * represents an asymmetric carbon atom, provided that at least one of R^3 to R^7 and R^8 to R^{12} is a substituted amino group; and a transition metal compound represented by the formula (3):

$$[MX_mL_n]_p \qquad (3)$$

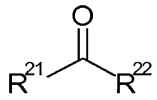
wherein M represents ~~a transition metal~~ ruthenium, X represents a halogen atom, L represents a ~~ligand~~ benzene which may be substituted with an alkyl group, m represents 2 ~~or 3~~, n represents ~~0 or~~ 1, and p represents ~~1 or~~ 2.

7. (original) The catalyst for asymmetric synthesis according to claim 6, wherein the catalyst for asymmetric synthesis is a catalyst for asymmetric reduction.

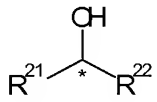
8. (Withdrawn) A process for producing an alcohol, which comprises subjecting a ketone to an asymmetric reduction in an aqueous solvent in the presence of the catalyst for asymmetric reduction of claim 5 or 7.

9. (Withdrawn) The process according to claim 8, wherein the ketone is a prochiral ketone, and the produced alcohol is an optically active alcohol.

10. (Withdrawn) The process according to claim 9, wherein the ketone is a ketone represented by the following formula (4):


(4)

wherein R^{21} and R^{22} each independently represent an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, or a ferrocenyl group, provided that $R^{21} \neq R^{22}$, and R^{21} and R^{22} may be bonded to each other to form a cyclic ketone having a substituent, and the resultant optically active alcohol is an optically active alcohol represented by the following formula (5):


(5)

wherein * represents an asymmetric carbon atom and R^{21} and R^{22} are the same as described above.

11. (Withdrawn) The process according to claim 8, wherein the asymmetric reduction is based on asymmetric transfer hydrogenation.

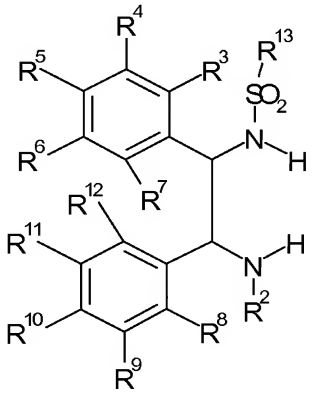
12. (Withdrawn) The process according to claim 8, wherein the catalyst for asymmetric reduction is recovered after use.

13. (Withdrawn) The process according to claim 12, wherein the recovery is performed in the form of an aqueous solution.

14. (Withdrawn) The process according to claim 8, wherein the recovered catalyst for asymmetric reduction is recycled.

15. (Withdrawn) The process according to claim 14, wherein the recovered catalyst for asymmetric reduction is a catalyst to be recycled in the form of the recovered aqueous solution.

16. (original) A diamine compound represented by the formula (1b):



(1b)

wherein R^2 represents a hydrogen atom, an optionally substituted hydrocarbon group, or $-SO_2R^{13}$ (wherein R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group), R^3 to R^{12} each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted aralkyloxy group, or a substituted amino group, and R^{13} represents

an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group, provided that at least one of R^3 to R^7 and R^8 to R^{12} is a substituted amino group.

17. (Currently amended) The optically active transition metal-diamine complex according to claim 3, wherein the transition metal compound represented by the formula (3) is selected from the group consisting of $[RuCl_2(benzene)]_2$, $[RuBr_2(benzene)]_2$, $[RuI_2(benzene)]_2$, $[RuCl_2(p\text{-}cymene)]_2$, $RuBr_2(p\text{-}cymene)]_2$, $[RuI_2(p\text{-}cymene)]_2$, $[RuCl_2(hexamethylbenzene)]_2$, $[RuBr_2(hexamethylbenzene)]_2$, $[RuI_2(hexamethylbenzene)]_2$, $[RuCl_2(mesitylene)]_2$, $[RuBr_2(mesitylene)]_2$, and $[RuI_2(mesitylene)]_2$, ~~$[RuCl_2(pentamethylcyclopentadiene)]_2$, $[RuBr_2(pentamethylcyclopentadiene)]_2$, $[RuI_2(pentamethylcyclopentadiene)]_2$, $[RuCl_2(cod)]n$, $[RuBr_2(cod)]n$, $[RuI_2(cod)]n$, $[RuCl_2(nbd)]n$, $[RuBr_2(nbd)n$, $[RuI_2(nbd)]n$, $RuCl_3$ hydrate, $RuBr_3$ hydrate, RuI_3 hydrate, $[RhCl_2(cyclopentadiene)]_2$, $[RhBr_2(cyclopentadiene)]_2$, $[RhI_2(cyclopentadiene)]_2$, $[RhCl_2(pentamethylcyclopentadiene)]_2$, $[RhBr_2(pentamethylcyclopentadiene)]_2$, $[RhI_2(pentamethylcyclopentadiene)]_2$, $[RhCl(cod)]_2$, $(RhBr(cod)]_2$, $[RhI(cod)]_2$, $[RhCl(nbd)]_2$, $[RhBr(nbd)]_2$, $[RhI(nbd)]_2$, $RhCl_3$ hydrate, $RhBr_3$ hydrate, RhI_3 hydrate, $[IrCl_2(cyclopentadiene)]_2$, $[IrBr_2(cyclopentadiene)]_2$, $[IrI_2(cyclopentadiene)]_2$, $[IrCl_2(pentamethylcyclopentadiene)]_2$, $[IrBr_2(pentamethylcyclopentadiene)]_2$, $[IrI_2(pentamethylcyclopentadiene)]_2$, $[IrCl(cod)]_2$, $[IrBr(cod)]_2$, $[IrI(cod)]_2$, $[IrCl(nbd)]_2$, $[IrBr(nbd)]_2$, $[IrI(nbd)]_2$, $IrCl_3$ hydrate, $IrBr_3$ hydrate and IrI_3 hydrate~~.

18. (Currently amended) The catalyst for asymmetric synthesis according to claim 6, wherein the transition metal compound represented by the formula (3) is selected from the group consisting of $[RuCl_2(benzene)]_2$, $[RuBr_2(benzene)]_2$, $[RuI_2(benzene)]_2$, $[RuCl_2(p\text{-}cymene)]_2$, $[RuBr_2(p\text{-}cymene)]_2$, $[RuI_2(p\text{-}cymene)]_2$, $[RuCl_2(hexamethylbenzene)]_2$, $[RuBr_2(hexamethylbenzene)]_2$, $[RuI_2(hexamethylbenzene)]_2$, $[RuCl_2(mesitylene)]_2$, $[RuBr_2(mesitylene)]_2$, and $[RuI_2(mesitylene)]_2$, ~~$[RuCl_2(pentamethylcyclopentadiene)]_2$, $[RuI_2(pentamethylcyclopentadiene)]_2$, $[RuCl_2(cod)]n$, $[RuBr_2(cod)]n$, $[RuI_2(cod)]n$,~~

~~$[RuCl_2(nbd)]n$, $[RuBr_2(nbd)]n$, $[RuI_2(nbd)]n$, $RuCl_3$ hydrate, $RuBr_3$ hydrate, RuI_3 hydrate, $[RhCl_2(cyclopentadiene)]_2$, $[RhBr_2(cyclopentadiene)]_2$, $[RhI_2(cyclopentadiene)]_2$, $[RhCl_2(pentamethylcyclopentadiene)]_2$, $[RhBr_2(pentamethylcyclopentadiene)]_2$, $[RhI_2(pentamethylcyclopentadiene)]_2$, $[RhCl(cod)]_2$, $[RhBr(cod)]_2$, $[RhI(cod)]_2$, $[RhCl(nbd)]_2$, $[RhBr(nbd)]_2$, $[RhI(nbd)]_2$, $RhCl_3$ hydrate, $RhBr_3$ hydrate, RhI_3 hydrate, $[IrCl_2(cyclopentadiene)]_2$, $[IrBr_2(cyclopentadiene)]_2$, $[IrI_2(cyclopentadiene)]_2$, $[IrCl_2(pentamethylcyclopentadiene)]_2$, $[IrBr_2(pentamethylcyclopentadiene)]_2$, $[IrI_2(pentamethylcyclopentadiene)]_2$, $[IrCl(cod)]_2$, $[IrBr(cod)]_2$, $[IrI(cod)]_2$, $[IrCl(nbd)]_2$, $[IrBr(nbd)]_2$, $[IrI(nbd)]_2$, $IrCl_3$ hydrate, $IrBr_3$ hydrate and IrI_3 hydrate~~.